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INFORMATION AND COMMUNICATION TECHNOLOGY IN THE CROATIAN TOURISM INDUSTRY

UNDERGRADUATE THESIS

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Abstract

The integration of Information and Communication Technologies is an essential for success of tourism enterprise. ICT enables individuals to access information about tourism products in just a few clicks at any time and any location. Tourism industry is one of the fastest growing industries and it is essential to know tourists needs in order to deliver quality experience and services. According to Tomas research average age of tourist visiting Croatia is 41. There is a decrease in share of Baby Boomers and increase in share of generation Y. Younger generations are more dependent on mobile technology and in order to satisfy their needs implementation of ICT is necessary. Tourism, like any economic activity, has produced detrimental environmental and socio-economic effect. ICT is an innovative approach in facing challenges toward sustainability.

Table of Content

1. Introduction.....	1
1.1 General.....	1
1.2 Objectives.....	3
1.3 Methodology.....	4
1.4 Structure of the thesis.....	4
2. The Role of ICT in Tourism.....	5
2.1 Tourism and internet.....	5
2.2 Tourism and information technologies.....	8
2.3 Sustainability.....	10
2.4 Mobile Technology.....	12
3. Trends in tourism industry.....	14
3.1 Current trends.....	14
3.2 Future trends of tourism.....	16
4. Statistical indicators how tourists use ICT in Croatia.....	18
4.1 Review of Attitudes and Expenditure of Tourists in Croatia – TOMAS 2014 & 2017.....	19
5. Digital Economy and Society Index (DESI) – 2019 Country Report – Croatia.....	22
6. Analysis.....	26
7. Suggested strategies.....	38
8. Conclusion.....	40

9. List of Reference.....	42
10. List of Illustrations.....	44
11. List of Graphs.....	45

1. Introduction

1.1 General

“Tourism has closely been connected to progress of ICTs for over 30 years. The establishment establishments of the Computer Reservations Systems (CRSs) in the 1970s, Global Distribution Systems (GDSs) in the late 1980s and the internet in the late 1990s have transformed operational and strategic practices dramatically in tourism”¹

“The digital and information revolution has changed the way the world learns, communicates, does business, and treats illnesses. New information and communications technologies (ICT) offer vast opportunities for progress in all walks of life in all countries - opportunities for economic growth, improved health, better service delivery, learning through distance education, and social and cultural advances. Today’s smartphones and tablets have computer power equivalent to that of yesterday’s computers and provide a similar range of functions. Device convergence is thus rendering the conventional definition obsolete. Comparable statistics on access, use, quality and affordability of ICT are needed to formulate growth-enabling policies for the sector and to monitor and evaluate the sector’s impact on development”.²

“In 2018, there were 18.7 million tourist arrivals and 89.7 million tourist nights recorded in commercial accommodation establishments. Compared to 2017, there was an increase in tourist arrivals of 7.1 %, and an increase in tourist nights of 4 %. Domestic tourists realised 2 million arrivals and 6.5 million nights, which is an increase in tourist arrivals of 10 % and in tourist nights of 8.3 %, as compared to 2017. Foreign tourists realised 16.6 million arrivals and 83.2 million nights, which is 6.7 % more arrivals and 3.7% more nights than in 2017.”³ As a country with approximately 4 million populations, tourism arrivals are relatively high, making tourism a major industry in Croatia. Numerous cultural and natural attractions as well wide variety of tourism activities attracts more and more visitors to Croatia.

¹ Dimitrios Buhalis, Soo Hyun Jun, E-Tourism, pp .4

² World Telecommunication/ICT Development Report and database

³ DRŽAVNI ZAVOD ZA STATISTIKU, (2019) Tourist Arrivals And Nights in 2018,

According to Croatian Government website, approximate income from tourism sector in 2018 was 12 billion euro, highest income ever recorded.⁴

Because of globalization there are more and more people who are willing to visit other countries and experience other cultures. As tourism is lucrative industry, many countries are trying to step on global market and gain competitive advantage against other countries. Especially today when technology is highly advanced, enabling everyone to easily promote their services throughout whole planet, reaching every individual.

To gain competitive advantage among many competitors, efficient use of technology is required. Best way to reach for potential tourists is through internet and social media. Almost every person on planet owns a smartphone, which is most efficient way to access internet and any information they require. Social media allows everyone to promote their services, making it important for tourism industry. Croatia has so much to offer, from beautiful coastline to amazing traditional cuisine, all which can be promoted on social media impacting people to decide to visit Croatia. This is only a small portion of what is technology able to do for tourism industry.

“Tourism is an important economic activity for any nation and to the world economy and it is not indifferent to technological progress, making use of it for the optimization of its business. Perhaps it was the sector that has suffered the most changes due to technological development”⁵

Tourism has been greatly affected with technological development, making players in tourism industry to learn and understand more about technology and its benefits.

⁴ Marko Pavić,(2019) Prihodi u turizmu u 2018. Godini procijenjeni na 12 milijardi eura, Central Government Portal, source: <https://vlada.gov.hr/vijesti/prihodi-u-turizmu-u-2018-godini-procijenjeni-na-12-milijardi-eura-sto-je-najvise-ikad/25185>

⁵ Elisabete Paulo Morais, Carlos Rompante Cunha, Joao Paulo Sousa, (2016), Information and Communication Technologies in Tourism: Challenges and Trends, Polytechnic Institute of Braganca, pp. 1

According to Buhalis, ICT is the driver of the tourism industry:⁶

- Cost drivers: increase efficiency, low distribution cost, low communication cost, low labour cost, minimization of waste factor, facilitator of flexible pricing
- Market drivers: satisfy sophisticated demand, flexibility in time of operation, support specialization and differentiation, provide last minute deals, accurate information, support relationship marketing strategies for frequent quests, quick reaction to demand fluctuation, multiple products, yield management, corporate intelligence, marketing research
- Government and regulatory drivers: deregulation, liberalization, government supported
- Competitive drivers: managing network of enterprises, value added skill building, flexibility, knowledge acquisition, strategic tool, barrier to entry

1.2 Objectives

In this paper there are three main objectives:

- To evaluate the role of ICT in tourism industry
- To determine the level of usage of ICT in Croatian tourism industry
- To suggest measures to improve quality in management by implementing ICT

⁶ Dimitrios Buhalis, (1998) Strategic use of information in the tourism industry, Dept of Tourism, University of Westminster, pp. 414

1.3 Methodology

To achieve the objectives of this paper, the research has been conducted in form of questionnaire. For research method Likert scale questionnaire with five offered answers ranging from “strongly disagree” to “strongly agree” has been conducted. Main purpose of this research is to evaluate user attitude toward ICT in tourism industry. Analysis of questionnaire served as a foundation for suggesting strategies on improving management by implementing ICT.

Data was collected and analysed from residents in Croatia. First set of gathered data is about respondent age, device preference, usage of smartphone, usage of social media and preferred means of payment. Second set of collected data was measurement of agreement about statements regarding information and communication technology.

1.4 Structure of the thesis

The first part of the paper will be focused on Information and Communication technologies and its impact on tourism industry. Internet, IT, mobile technology, sustainability will be explained as well as their impact on tourism industry. In second part, current and future trends will be observed and interpreted. Third part of the paper will focus on statistical indicator in usage of ICT in tourism industry and tourists preferences. Fourth part will focus on research results from questionnaire and will discuss on suggested strategies. The final part of the paper will present conclusion based on main entries, findings and data collected through conducting questionnaire.

2. The Role of ICT in Tourism

2.1 Tourism and internet

The internet is the most important innovation. There have been significant innovations such as automobile, TV, airplane, electricity which had great impact on business and lifestyle. However internet combines features of existing media, enabling interactivity and transforms businesses. Billions of people worldwide use internet for learning, working, shopping, entertainment, leisure activities. According to page (www.internetworldstats.com⁷), in 2019 there are 4,436,248,808 internet users.

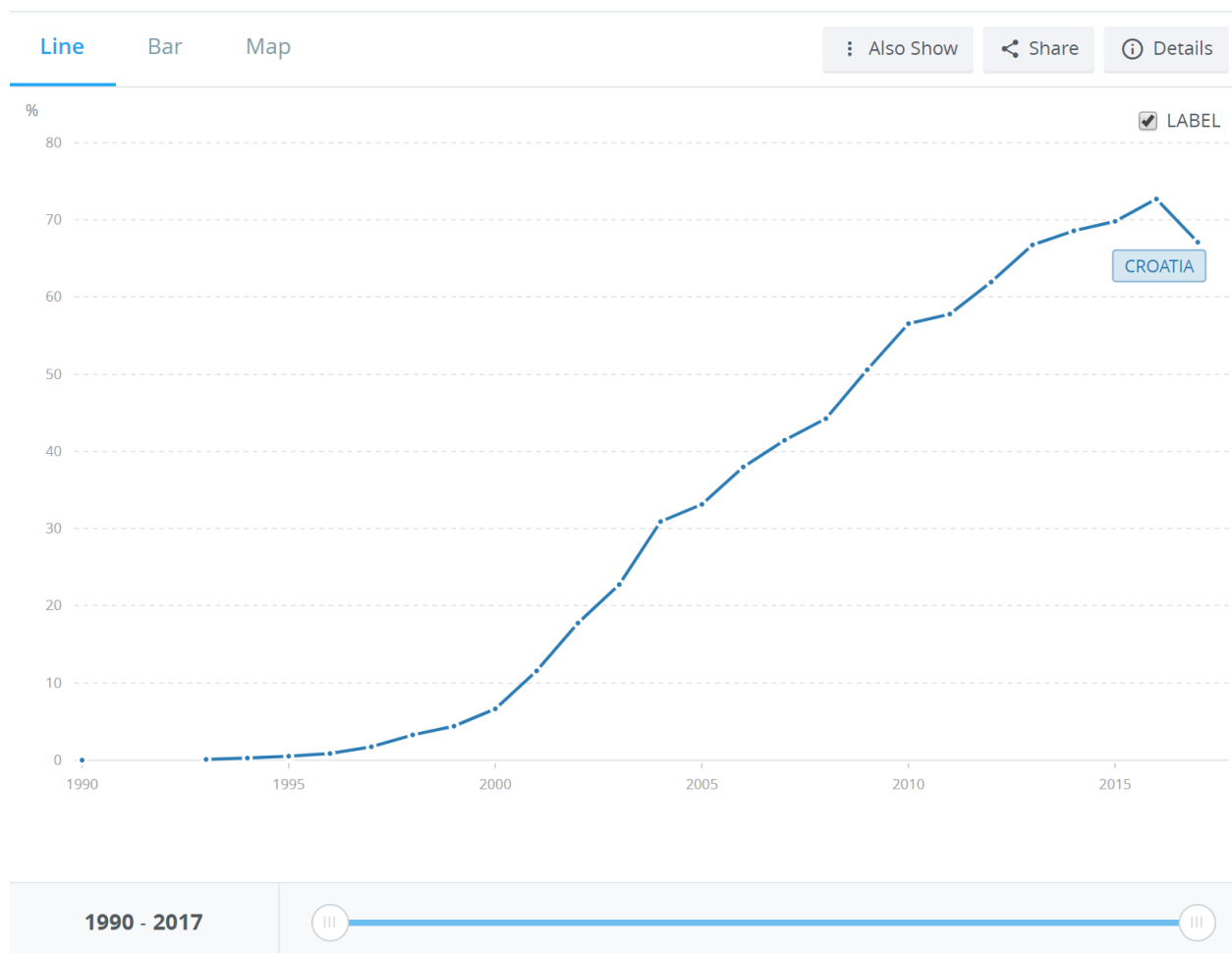
In the globally networked business environment, e-business is essential for successful organisations in tourism industry. ICT and internet had many compelling impact on communication with consumers and on organisations with improved structure, operation and strategy. Increased capabilities in ICT decreased the size of equipment and cost, while improving interconnectivity, compatibility and reliability of various applications. Tourism organisations are capable to adapt their management in order to use digital tools more efficiently.⁸

The internet is important to tourism because it allows consumer or tourist to quickly gather information about anything they require. In tourism industry, online technology improved transactions, communications and relationships between industries and with customers, but also between regulators and operators. Internet enhanced collaboration among tourist operators and increased inter-operability between internal and external applications.⁹

⁷ Usage and World Stats, Internet Usage Stats and Market Report Croatia, source: <https://www.internetworldstats.com/eu/hr.htm>

⁸ Dimitrios Buhalis, Soo Hyun Jun, E-tourism, pp. 1 - 10

⁹ Wayne Pease, Michelle Rowe, Malcolm Cooper, The Role Of ICT In Regional Tourism Providers, pp. 3



Source: <https://data.worldbank.org/indicator/IT.NET.USER.ZS?locations=HR>

Graph 1. The World Bank, Individuals using the internet (% of population)

In Balkan region, internet usage in Croatia is among highest. In 2017 internet usage decreased from 72.7 % to 67%. There is a positive indicator in steadily increase of internet usage from 1993 to 2016. This increased usage is connected with steadily improvements in internet infrastructure and becoming available to more and more people.

In 2008 at the time of recession, tourism played key role as practically entire Croatian economy relied upon it. In recession, economic activity is decreasing, but the total share of tourism in Croatia amounted to impressive 15.7 % of total GDP. Ministry of Tourism and Ministry of Economy, Labour and Entrepreneurship signed contracts with counties on joint investment. Government offered grants and subsidized

commercial loans for SMEs, accommodation sector, preservation of traditional landscape and development of tourism in rural area. Main idea was to exploit potential that new technology offers in order to provide additional support in realizing tourist plans for the future. Internet changed the classical ways of communicating, informing, promoting and marketing, as tourist online businesses in market continued to grow with extremely high rates.

In Croatia, importance of internet in tourism industry grew strongly over the years. Agencies recognized the need for modern technology in the sustainable development is necessary to gain profit. Internet enabled less known tourist destinations to show their potential on global market. It is also important to mention the fact that number of websites of hotel companies increased, giving internet marketing important role in product distribution and promotion. In time of holidays, tourist services intensively use internet in order to offer a range of information, advertise, save money and time. What makes this type of communication great is a fact that all necessary information is available at any time, unlike classic travel agencies, whose business is limited by working hours. Internet allows us to reach a large number of users without spending too much time. Digitized money and virtual shop are main drivers of growth in purchase through internet.¹⁰

Advantages of the internet:¹¹

- **Effectiveness:** Information on the internet is effective with respect to the number and structure of the users.
- **Fast results:** Users can find all the information of their interest at one point
- **Interactivity:** The service provider and the user can communicate on the internet

¹⁰ Demonja Damir, Čupić Renata, Jelinčić Daniela, (2010), Contribution to the Research of the Internet in the Service of Tourism – Situation in Croatia and in the World, Institute for International Relations, Zagreb , pp. 40 - 41

¹¹ Ibid , pp. 42

- **Flexibility and dynamism:** User create proposal of their own, which will provide a permanent flow of information about user habits, and if they get what they expect, they will visit the same website again.
- **Wide range:** Diversity of offer and content ensures wide access.
- **Availability:** Offer is available 24 hours a day.
- **Target audience:** Diverse offer influences different structures of potential users.
- **Feedback:** Services such as survey or prize contest, popularize offer of service provider, and can be used for various study

2.2 Tourism and information technologies

“Tourism is inevitably influenced by the business process re-engineering experienced due to the technological revolution. As information is the lifeblood of the travel industry, effective use of ITs is pivotal. Hence, a whole system of ITs is being rapidly diffused throughout the tourism industry and no player will escape its impacts”¹²

Tourism services is intangible good, they cannot be physically displayed and inspected up to the point of sale. They are bought away from the point of consumption, therefore their sale depends on description and representations such as information in brochures, website, social media, review sites. They are provided by travel trade and depending on their ability to attract consumers, service will be sold. To efficiently attract consumers, accurate and timely information regarding consumer needs is necessary, as it is often a key to satisfy tourists and their demand.

The revolution of IT enabled more efficient management of the tourism industry with efficient co-operation and by offering tools for globalization. As supply and demand rapidly developed, ITs imperative became to increase role in tourism promotion, distribution, marketing and co-ordination.

¹² Dimitrios Buhalis,(1998) Strategic use of information in the tourism industry, Dept. of Tourism, University of Westminster, pp. 411

IT had an enormous impact on travel industry because the entire sector had to change the way it organizes business lie education of its workforce or norms of behaviour. Key success lies in fast identification of customer needs and reaching to a customer with up to date and personalized information.

ITs is driven by complexity of tourism demand, development of the size and sophistication of new tourism product. To satisfy tourism demand incorporation of technology and intense interaction with marketplace is necessary. Visitors are able to access accurate and reliable information and make a reservation in a fraction of time. IT contributed to higher guest satisfaction and improved service quality because gap between perceived experiences and consumer expectations decreased and unpleasant surprises are minimized. Consumers have more information and wider choice of possibilities and reduced bureaucracy and paperwork saves time and allows customer service to establish “one-to one” marketing. IT greatly impacted tourism marketing, distribution, production and operational functions.

It is important to adapt to new business environment to take advantage of emergent opportunities. It is possible by introducing innovative and unprecedented method. Distributing right marketing mix through right intermediaries is an important factor for long term success. IT not only positively affects distribution, but it also reduce cost and empower interactive communication with target market.¹³

¹³ Ibid, pp. 411 - 412

2.3 Sustainability

Through decades researchers on tourism tried to describe sustainability in the field. They were able to formulate concept of sustainable tourism and established a theoretical foundation for further quantitative studies. With appearance of smartphones, mobile technology relationship with tourism became a driver of change in sustainable tourism framework. Sustainability in tourism theme emerged with regulatory interest to resolve concerns regarding environment and global inequality in 1960s when tourism as industry started to grow. It was primarily based as a observation of negative impacts of tourism which exceeds benefits. Some of those observed negative impacts are: increase in the housing price, inflation, influx of strangers, increases in crime rate. Main goal of sustainable development was to minimize negative impacts and maximize economic, social and environmental impacts by proposing ethical goals to stakeholders (firms, residents, firm).

In 2007, release of Iphone sped up the adoption of smartphone technology and deployment of Wi-Fi mobile networks and Long-term-evolution (LTE) technology, making mobile technology crucial determinant of quality of life. Mobile technology is able to deal with challenges that have persisted by continuous assessment of tourism impact, monitoring and studying interactions, observing interactions between tourists and environments, planning tourism developments by analysing tourist needs and expectation.¹⁴

WTO and UNEP define sustainability as follows: „Tourism that takes full account of its current and future economic, social and environmental impacts, addressing the needs of visitor, the industry, the environment, and host communities“¹⁵

Sustainable tourism should make optimal use of environment resources, maintain ecological process, conserve nature and biodiversity, respect socio cultural authenticity of visiting destination, contribute to cultural understanding and tolerance, ensure long term operations, include stable employment and contribute to alleviate

¹⁴ Dongwook Kim, Sungbum Kim, (2017) The Role of Mobile Technology in Tourism: Patents, Articles, News, and Mobile Tour App Reviews, Korea Advanced Institute of Science Technology, pp. 1-2

¹⁵ UNTWO Sustainable Development of Tourism, source: <https://sdt.unwto.org/content/about-us-5> (3.9. 2019.)

poverty. Sustainable tourism requires participation of every individual to ensure wide participation. It is a continuous process which requires regular monitoring of impacts and introducing corrective measures when necessary.¹⁶

In 1993, Croatian government issued Development Strategy of the Croatian tourism as 1st strategy. Basic goals were valorisation and protection of tourism resources, and reconstruction. It stressed the importance of having necessary infrastructure, especially for communications and transport with islands. It also stresses the importance of building awareness about environment.

2nd strategy was issued in 2003, for period 2003-2010. “Tourism largely drives the economic growth of the Republic of Croatia for the benefit of all its citizens, under the premise of sustainable usage, protection and developments of its natural, historical and cultural resources, while creating a favourable investments climate”,¹⁷ 2nd strategy included strategic principles where space is the most valuable tourism resource: Local communities have an important role to play in planning decision, physical planning to support sustainable development of tourism, preservation and protection of cultural and historical heritage is a key for sustainable tourism development. Those principles are summarized in the logo “The Mediterranean as it once was”.

Tourism sector started to shift from mass tourism to quality tourism. SMEs in tourism were offered subsidized interest rate for loans, accommodation sector also received grants in differed amount and 107 facilities were preserved with the amount of 366 million HRK (48.8 million €). Rural Tourism also received grants for development of tourism in rural areas and subsidized interest rate. Measures were aimed in preserving environment for young, to stop depopulation rural areas and to revive local traditions and gastronomy. Ministry of Tourism also encouraged development of thematic routes in order to shoe traveller the attractiveness of tourist offer in Croatia. From 2007 to 2009, 173 projects received 11 million HRK.

¹⁶ Ibid (3.9.2019.)

¹⁷ Belosevic Blanka, Current Trends in Sustainable Tourism – Example of Croatia, Ministry of Tourism, pp. 4

Another strategy project was to encourage the production of authentic souvenir for tourist. For that cause, 2645 projects were awarded with 8,8 million HRK. Other quality measure was quality label for hotels. It is a award that satisfies standards in having high quality services. High quality environment standards were also included as hotel had to satisfy modern trends (“green hotels”).¹⁸

Ministry of tourism currently work on “Strategy and Master plan for Croatian tourism”, which is expected to be finalized till 2020. It will be drafted through debate, workshops and consultation with experts. Key challenges in this strategy are: climate change, seasonality, physical planning, continental tourism, etc.¹⁹

2.4 Mobile technology

Majority of travellers prefers to plan traveling through internet. Mobile technology is able to collect and deliver data through network, sensor, IoT and chip. Mobile technology can be classified into four categories:²⁰

- The first type is a technology related to data collection, analysis and communication. It includes search technology and sensor that collects data from interaction between tourist and environment, and communication wireless technology such as NFC and RFID
- Smartphone device is the second type of technology. It enables user to access information. Through smartphone user is able to enjoy innovative experiences, and those experiences can be managed by consumer or tourism related companies. This type of technology also includes virtual reality and augmented reality which is an ideal marketing tool in tourism as it allows users pre-experience.
- Third type overlaps with previous two types, but it is important to separately explain system that assists tourism activities as another

¹⁸ Ibid, pp. 3-14

¹⁹ Ibid, pp. 18

²⁰ Dongwook Kim, Sungbum Kim, (2017) The Role of Mobile Technology in Tourism: Patents, Articles, News, and Mobile Tour App Reviews, Korea Advanced Institute of Science Technology, pp. 7-8

technology. Management information system initially served as internal inventory control, which shifted to a computerized reservation system to stimulate airline bookings and transactions. Computerized reservation system (CRS) improved quality of tourism service with many different forms of technology such as: ticket system, reservation system, recommendation system, intelligent advisory systems, tourism assessment system, knowledge management system for tourism. Recommendation system is most researched system as a technology. It allows users to collaborate and rate a product or recommend service and product based on user preferences

- Fourth type is a newly emerging technology that includes data-related functionalities implemented as a system. For further improvement in smart tourism, it is expected that new form of innovation and business will emerge which will be able to synchronize with different kind of technologies

With technological advancement in mobile technology, various mobile services emerged. Smartphones are able to access the internet, locate people and places, view images and videos, share information on social media with friend, etc. It evolved from a communication device to instrument that facilitate interaction. Mobile devices became primary means of internet access.²¹

²¹ Elisabete Paulo Morais, Carlos Rompante Cunha, Joai Paulo, (2016), Information and Communication Technologies in Tourism: Challenges and Trends, Polytechnic Institute of Braganca , pp. 1385

3. Trends in tourism industry

3.1 Current trends in tourism

In many countries, international tourism became the most important economic activities and major source of employment opportunities and earnings. Because of positive economic effect, tourism industry became industry of great importance for many developing countries. Trends on global market are plagued by uncertainty and insecurity, but it is expected that tourism industry on global level will continue to record growth trends. With increased awareness for sustainable development it is necessary for tourism planning to be ecological and long term.²²

Tomas research results indicates that the average age of tourist in Croatia is 41. Share of tourist in middle age (30 till 49) is relatively stable during whole summer period, 51% to 56%. It is also important to notice how in the first time, the share of Baby Boomers decreases and share of Y generation increases. World trends implies that it is necessary to continuously follow demands of those two generation. Educated tourists who are visiting Croatia in 2017 are relatively high (38 %), compared to 2007, when percentage of educated tourists was 29 %.

Consumer travel trends in 2019:²³

- **Travel “to change”:** (Live like a local, quest for authenticity and transformation)
- **Travel “to show”:** (“Instagramable” moments, experiences and destinations)
- Pursuit of a healthy life: Walking, wellness and sports tourism
- **Rise of the “access” economy**
- **Solo travel and multigenerational travel:** as a result of aging population and single households
- **Rising awareness on sustainability:** (zero plastic and climate)

²² Branka Stipanovic, Mirko Smoljic, Dinko Primorac, (2014) The Adaptation of Tourist Agency Business in Croatia – Dominant trends in Global Tourism, pp.3

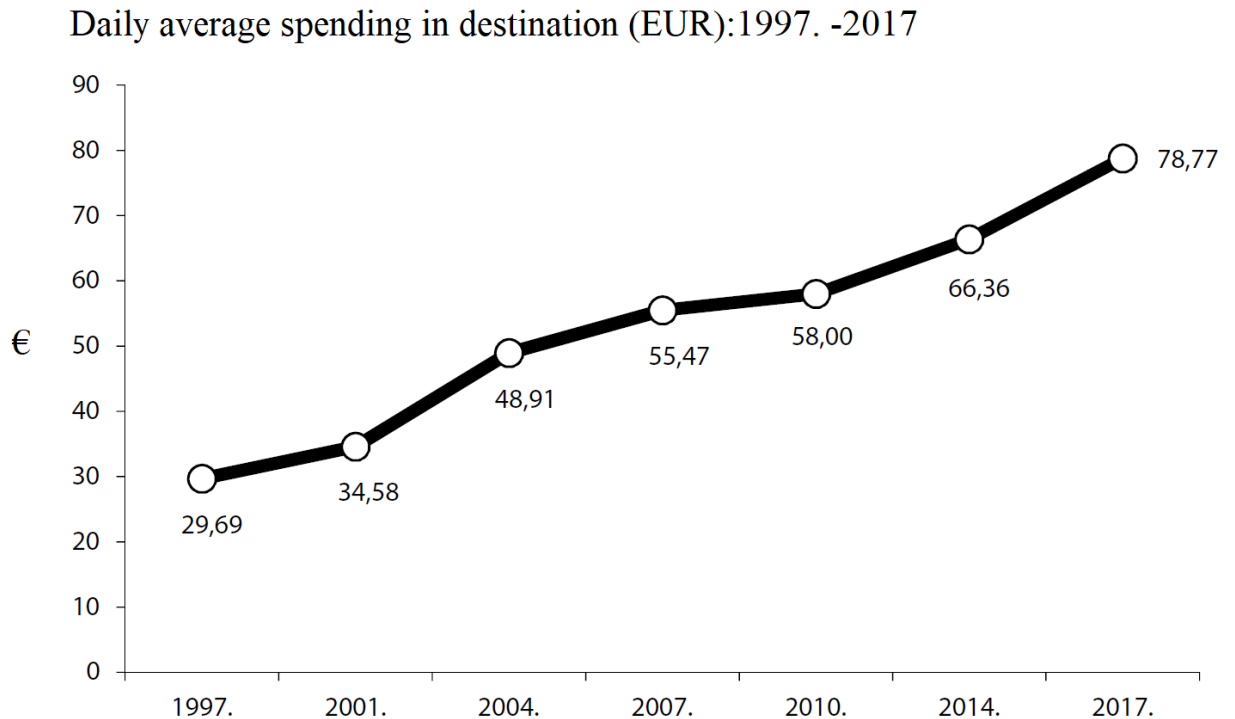
²³ International Tourism Highlights, (2019 Edition), pp. 4

Tourism industry is important for Croatia. It accounts approximately 20 % GDP and it is biggest employers. Revenue from foreign and domestic tourist combined amount to 12 billion €. 2018 was the record year for tourism industry with 106 million overnights and 19.7 million tourists. Even though numbers are impressive, compared to 2017, it was 4 % increase in overnight stays and 6.5% in tourist numbers.

Reason for slowed growth potentially lies in the rise of competition on global market. Greece, Turkey and North Africa had serious problems in the past, which lead to a huge drop in travellers. But those countries started to work hard in order to attract tourist once again, mostly through price discounts. Because of that, those countries are once again drawing large number of visitor, adding competition to the Croatia coastline.

Effect of tourism industry shouldn't be underestimated. Every fifth KUNA earn comes from tourism industry, meaning it generates large amount of tax revenue. It is also a great sales channel for domestic product such as olive oil, wine and souvenirs. Ministry of Tourism announced in 2019 direct investments in tourism sector in the amount of 1.5 billion Euros, which is an significant increase from 2018 when investments amounted to 940 million Euros. But Croatia is facing serious problems with lack of workers. Government is facing a problem of young population leaving in Germany, Sweden, Ireland for better prospects. Short term solution lies in employment of foreign workers. In 2019, government increased the number of visas for foreigners to 60 000.²⁴

²⁴ Thomas Mark, (2019), Challenges facin Croatian tourism industry in 2019, source: <https://www.thedubrovniktimes.com/news/croatia/item/6074-challenges-facing-croatian-tourism-industry-in-2019>



Graph 2. – Daily average spending – TOMAS 2017

Compared with 2014, tourist average daily spending in 2017, nominally increased for 19 %. Expenditure in catering services increase for 7 %. Considering the type of accommodation, expenditure increased in hotels is 15 %, camps 20 % and in private accommodation 31 %.

3.2 Future trends of tourism

Trends on global market are plagued by uncertainty and insecurity, but it is expected that tourism industry on global level will continue to record growth trends. Population is aging and average lifespan rises, meaning that senior population will establish themselves as an important group in tourism demand on global level. As demand and desire changes, the need for market segmentation arises. Increase diverse demand, psychographic characteristic and increase focus on individual tourists trips are main point in detailed market segmentation. There are ten trends that researcher predicted to have an important impact on consumers: expectations, encouraging growth,

technological acceleration, globalization, peacetime, war, changed behaviour, debt collapse, focus on yourself and research, “close to home” syndrome.²⁵

“Information technologies influence the strategic management and marketing of contemporary organizations, as a paradigm-shift is experienced, transforming the best business practices globally. ITs transform the strategic position of organizations, by altering their efficiency, differentiation, operational cost and response time.”²⁶

IT stimulated radical changes in distribution and operation of the tourism industry. One of the examples is booking online, which saves considerable time for industry and consumer. The focus is shifting toward targeting mini segments and individual travel. The success of tourism organizations will be determined by combination of innovative marketing and management, vision, strategic use of advanced IT and intellect.²⁷

There are currently negotiations in UK regarding Brexit, more specifically “No Deal” Brexit. If such deal realized, in short term it would benefit from increased price attractiveness, but in the long run travel and tourism will be negatively impacted from airline disruption, economic drivers and increased passport regulations.²⁸

²⁵ Branka Stipanovic, Mirko Smoljic, Dinko Primorac, (2014) The Adaptation of Tourist Agency Business in Croatia – Dominant trends in Global Tourism, , pp.3

²⁶ Dimitrios Buhalis, (1998) Strategic use of information in the tourism industry, Dept of Tourism, University of Westminster, pp. 419

²⁷ Ibid, pp. 419-420

²⁸ European Travell Commission, European Tourism in 2018: Trends and Prospects, pp. 19

4. Statistical indicators how tourists use ICT in Croatia

Institute of tourism in Croatia conducts various primary research. Most known research is Tomas which has been conducted since 1967. It includes opinions and spending of tourists in Croatian tourist destinations during summer, while sailing, in transit, visiting Zagreb and national parks. In summer 2017, Tomas research had been conducted for the jubilee tenth time. Tomas purpose is collection of information in order to plan and make important decisions for improving tourism industry.

Results over the year followed the trends movements, stagnations period and fall. Data in TOMAS confirms successful tourist season in 2017 and consistently shows continuation of trends identified in 2014 and before. Research also shows that Croatia attracts tourists through improved quality, diversification of tourism product and improved services in tourism. Rising customer satisfaction and tourist spending confirms it.

Next research should focus on entire year in every part of Croatia, since season is being prolonged every year and continental part of Croatia rises in regard of tourism. That way we can followed trends from different parts of Croatia and identify main advantages for each region specifically. Continental region tourism sector is lagging, but it stills shows trend of growth. Its focus should be on green, clean and interesting segment of tourism.

Tomas results continually discovers certain advantages and disadvantages in supply, analysis possibilities, rating tourist destinations competition level and possibility of tracking effects of various trends, making it an efficient tool in following Croatian tourism product success. New forms of tourism are still arising, giving Tomas research great importance for further research in order to discover new trends. Per tourist, average daily expenditure is 79 €, and 49 % of that expenditure is for accommodation, 17 % on food and drink and 34 % on other services. Such information gives us insight on what to expect next season, in which service to increase investment, making new food menu to attract quest, invest in accommodation units, etc. Following tourist movements and keeping track of their needs allows us to stay competitive on highly competitive market.

4.1 Review of Attitudes and Expenditure of Tourists in Croatia – TOMAS 2014. & 2017.

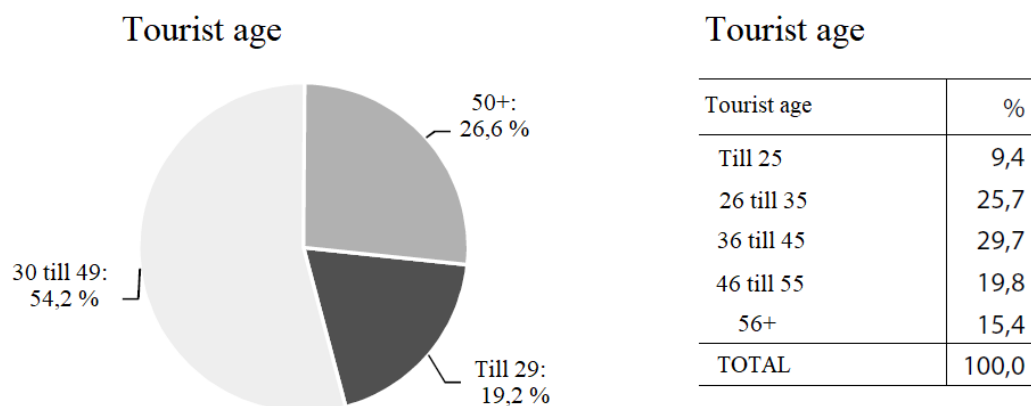


Figure 1. & 2. Tourist age – TOMAS 2017

Socio demographic tourist profile is basic information for marketing related activities. Tourist age structure is showed on two ways, including the structure of generational groups, enabling comparison with world trend demands.

Tourists in middle age are most dominant generation with average age of 41. It is interesting to see how for the first time share of Baby Boomers (1943.-1960.) is decreasing while on the other hand generation Y (1981+) is increasing. The importance of this trend is the fact that younger generation are more technological literate and more importance should be placed when deciding on promoting tourism related services to them. Younger generations prefer to capture moments while staying in tourist destination and share those moments on social media to share it with their friends and follower making it ideal place for promotion. We can look at it as a most efficient word to mouth method, but instead of reaching several individuals, it is possible to reach mass group of people.

Regarding socio demographic tourist profile, 41.5 is the average age of tourist, 54% is in age between 30-49, 19 % is younger than 30 and 27 % is older than 50 years. 38 % of tourist is university educated and 40 % have average income more than 3000 €

Reasons for visiting Croatia

Num	Reason/motives	%
1.	Relaxation	54,9
2.	New experiences	31,1
3.	Gastronomy and traditional cuisine	29,0
4.	Nature	26,2
5.	Entertainment	24,2
6.	Sports and recreation	19,8
7.	Cultural sites	12,3
8.	Visiting family and friends	9,8
9.	Wellness	7,6

Figure 3: Reasons for visiting Croatia – Tomas 2017

As demography and lifestyle of European population changes, more tourist travels for various different reasons. Tourists who are “poor with free time” want to satisfy more of his interests during one trip. At the same time there is an increase in diverse supply of products and services in Croatian tourist destination. Changes in tourists motivation reflects directly on increase activity in summer vacation destinations. Observing motives for visiting Croatia, allows tourist organisation to improve their product and service in order to capture attention of potential customers. Customer satisfaction increase chances of buying again same product or service.

Sources of information

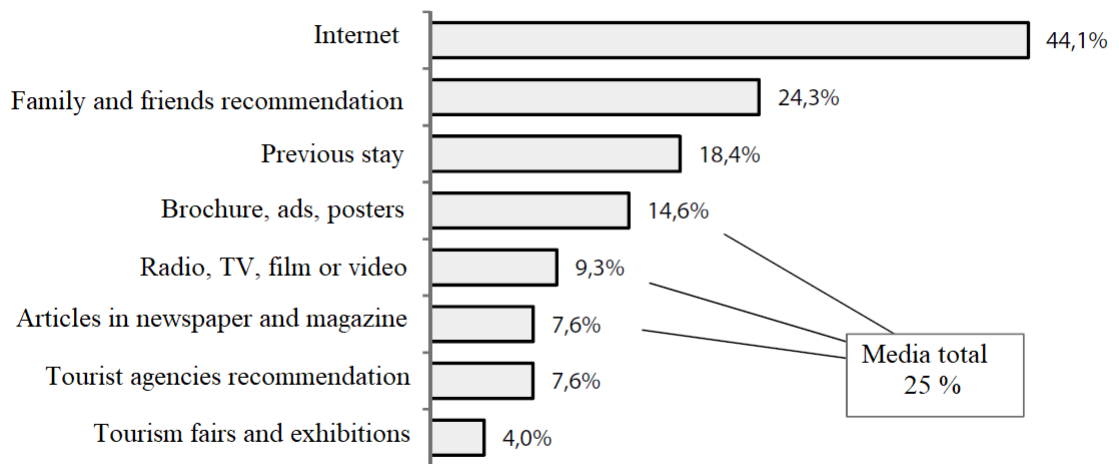


Figure 4: Sources of information – Tomas 2017

Internet as source of information

Internet as source of information	%
Social media (Facebook, Trip Advisor, Instagram, Twitter...)	67,0
Online tourist agencies (Booking.com, Expedia, Holidaychech.de)	50,7
Web pages of national and local Croatian Tourist Board	45,5
Web pages of apartments	44,4

Figure 5: Internet as source of information – Tomas 2017

Sources of information are changing based on the influence of technologies development and tracking them is important for everyone in the field of promotion and information services in tourism. Main source of information for tourists in Croatia is internet (44 %). 25% relied on various media, while 24 % relied on recommendation of family and friends and 18 % on previous stay.

From those who use internet as source of information, 67% of them prefer social media, but informing over web pages over national and local tourist board is also in great number. Internet is primary source of information for younger and middle population, while older generation generally prefers media, especially brochure and pamphlets.

Based on the previous Tomas research in 2014, in 2017 importance of internet as a source of information steadily increase (from 30 % in 2014 to 44% in 2017) and in 2017 for the first time, it became primary source of information. It is also interesting that when Tomas research in 1997 for the first time included internet a research, only 1.5 % of tourists used it.

Social media is becoming the most dominant source of information on internet for tourists in Croatia (from 39 % in 2014 to 67% in 2017). Also, usage of different media also increased from 20% in 2014 to 25 % in 2017, which implies on simultaneously usage of different media and sources of information.

5. Digital Economy and Society Index (DESI) – 2019 Country Report – Croatia

“The European Commission has been monitoring Member States digital competitiveness with the Digital Economy and Society Index (DESI) reports since 2015. The set of reports includes both country profiles and thematic chapters. The DESI country reports combine quantitative evidence from the DESI indicator across the five dimensions of the index with country – specific policy insights and best practices. The thematic chapters present a European – level analysis of broadband connectivity, digital skills, use of the internet, digitisation of business, digital public service, the ICT sector and its R&D spending.”²⁹

From 2019, DESI covers: 5G readiness, above basic digital skills, at least basic software skills, female ICT specialist, ICT graduates, people who never used the internet, professional social networks, doing an online course, online consultations and voting, individuals selling online, big data, medical data exchange and e-prescriptions

²⁹ Digital Economy and Society Index (DESI), 2019 Country Report, Croatia

	Croatia		EU
	rank	score	score
DESI 2019	20	47.4	52.5
DESI 2018	21	43.8	49.8
DESI 2017	20	41.4	46.9

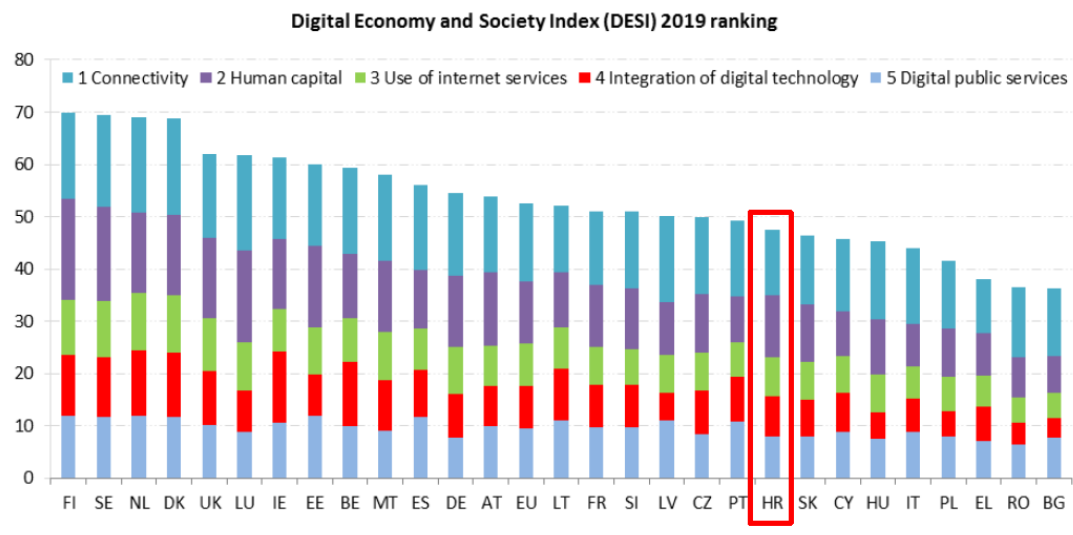


Figure 6&7 – DESI ranking

Croatia ranks 20th out of 28 EU Member States in DESI. Croatia performed well in broadband coverage, improved 4G and NGA, but it still performs low in connectivity. Croatia made progress in internet usage and digital public services. Croats are among keenest readers of online news and Croatian companies are using social media, big data and e-commerce. But one fifth of Croatian still does not use internet. In spite of increased demand of ICT experts on labour market, their numbers keeps decreasing. Croatia ranks highest in the Human capital (eight highest share of ICT graduates).

1 Connectivity	Croatia		EU
	rank	score	score
DESI 2019	27	50.1	59.3
DESI 2018	27	43.5	54.8
DESI 2017	27	39.0	51.2

Figure 8 – Connectivity

Croatia remained at the bottom of the ranking, as there weren't any significant improvements in connectivity.

Croatia lacks a strategy for 5G deployment which could improve wireless connectivity.

2 Human capital	Croatia		EU
	rank	score	score
DESI 2019	13	47.1	48.0
DESI 2018	13	46.1	47.6
DESI 2017	15	43.2	45.4

Figure 9 – Human capital

In human capital, Croatia ranks 13th out of 28 EU Member States, slightly below the average. Croatian SMEs lack ICT specialists and companies face challenges in filling vacancies. Number of ICT graduates keeps increasing, but in ICT sector, only 0.9% employed are women. New improved curriculum introduced pilot project eSchool: “Established of the Digital Maturity Schools Developments Programme” in 151 schools. This project brought technology and digital content to the primary and secondary schools.

3 Use of internet services	Croatia		EU
	rank	score	score
DESI 2019	15	49.7	53.4
DESI 2018	18	46.1	50.7
DESI 2017	12	46.7	47.8

Figure 10 – Use of internet services

In the use of internet services, Croatia is within EU average. Croatians engage in variety of online activities: listening to music, watching videos, using social networks, reading news, playing games. 91 % of Croatian read news online which is relatively high in comparison with the rest of the EU, 72 %.

4 Integration of digital technology	Croatia		EU
	rank	score	score
DESI 2019	18	38.6	41.1
DESI 2018	18	36.9	39.6
DESI 2017	17	35.9	37.6

Figure 11 – Integration of digital technology

Among EU countries, Croatia ranks to 18th on integration of digital technology within business. Croatian companies are slowly integrating digital technologies in business practices. 15.5 % of companies are at high level of digital intensity, 18 % of SMEs sells online, social media are used by 16 % of companies and 22 % by cloud. Unfortunately big data is analysed only in every tenth company in Croatia. In order to boost digital transformation in Croatian economy, it is important to raise awareness of the importance of the digitisation in SMEs.

5 Digital public services	Croatia		EU
	rank	score	score
DESI 2019	22	53.0	62.9
DESI 2018	23	47.3	57.9
DESI 2017	21	44.5	54.0

Figure 12 – Digital public services

On digital public services, Croatia ranks below EU average (22nd). Croatia performs well in e-prescriptions and online interaction between public authorities and citizens in in a high level (75 %).

Croatia started to develop electronic process to link all data of registering companies and start-ups through e-Citizen system. This platform allows companies to access document regarding health, taxation, insurance and pension. E-Citizen enables easier communication between public and public sector, making services more transparent.

6. Analysis

To achieve the objectives of the study, research in form of Likert scale has been conducted. Respondents were offered 5 answers ranging from “I disagree completely” to “I agree completely” to measure respondents’ agreement with variety of statements regarding information and communication technology. Research in form of questionnaire was conducted during summer season from July 15th to August 15th and 82 people solved the questionnaire. First part of analysis includes information regarding respondents age and general preferences regarding technology. Second measures respondent agreement about various statements in order to measure their level of ICT preferences.

What is your age?

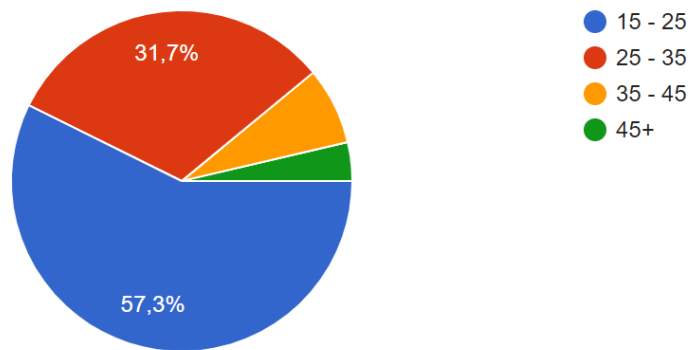


Figure 13 – Respondent age

Out of 82 respondents, 57.3 % are the age between 15-25, while 31.7 % of them are between the age of 25-35 and 11% are older than 35.

What device do you use most frequently to access the internet?

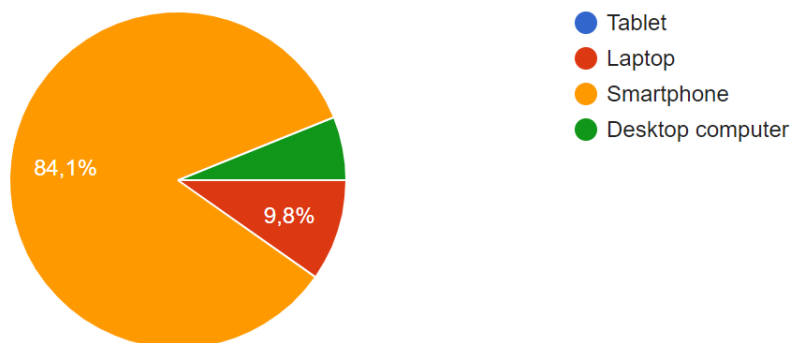


Figure 14 - Device preferences to access internet

84.1 % of respondents most frequently use smartphone to access the internet, while only 15.9 % uses either laptop or desktop clearly shows how smartphone became the most

dominant device. Exponential development in technology brought us smartphone devices, who are the size of our hands but are capable to preform same functions as larger devices such as laptop or desktop computer.

Mostly used social media:

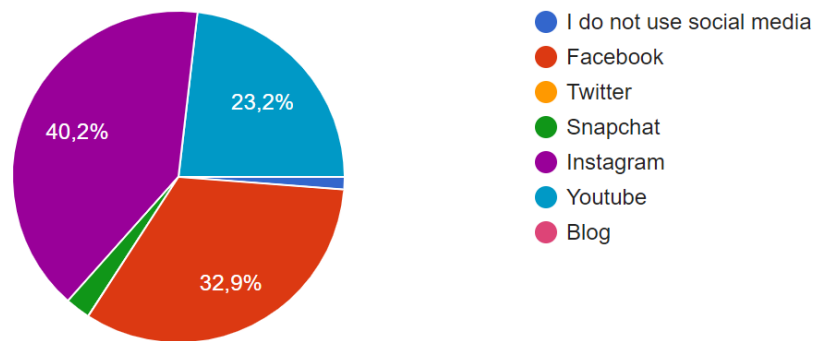


Figure 15- Most used social media

Instagram (40.2 %), Facebook (32.9 %) and Youtube (23.2 %) are most used social media. Those three apps are ideal medium of promotion. It is possible to reach thousands of social media users for a small fee. Social media use algorithms to collect information about user preferences and target them with services and product that corresponds to their preferences.

How many hours do you spend on a smartphone?

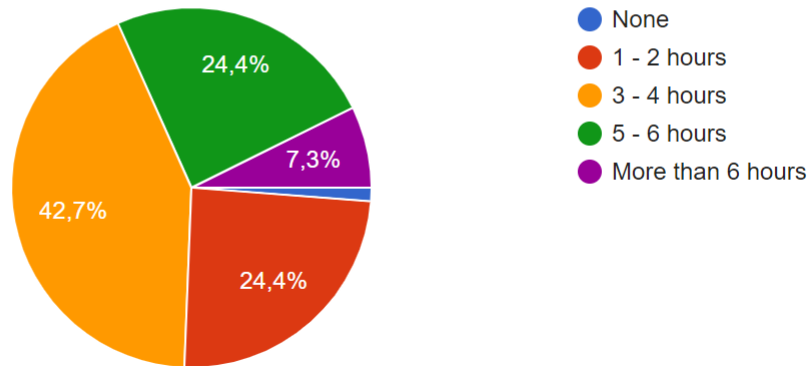


Figure 16- Time spent using smartphone

As technology developed, mobile phones became more sophisticated and users became more depended on it. 42.7 % of respondents use smartphone for 3-4 hour on daily basis, while 24.4% use smartphone for 1-2 hours. It is interesting to see that 31.7 % uses smartphone for more than 5-6 hours. Percentage of smartphone user is relatively high, which means that it is most efficient to promote services and product through channels that smartphone supports.

What means of payment do you most prefer?

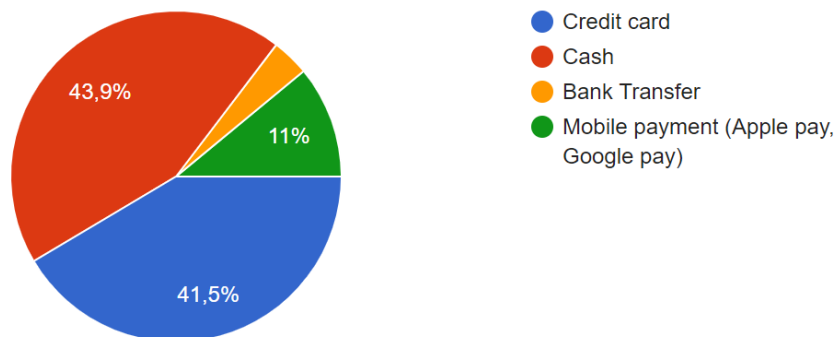


Figure 17- Preferred mean of payment

43.9 % prefers cash as a mean of payment while 41.5 % prefer credit card. It is also interesting to see even though mobile payment is relatively new in Croatia, 11 % of respondents prefer it as a mean of payment. With Apple or Google pay to complete payment, mobile device is places on POS terminal. It does not require pin as mobile device is already authorized.

Booking.com / Airbnb are the most efficient way of looking for accommodation during holiday.

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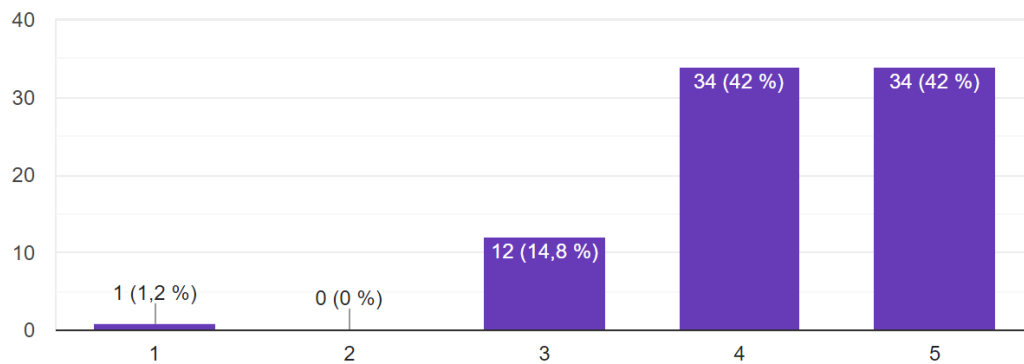


Figure 18- Preference of travel websites

84% of respondents agree that online Booking.com or Airbnb are the most efficient way of looking for accommodation during holiday. 14 % were uncertain whether to agree or not with the statement. Only 1 respondent disagreed with the statement. It is evident that travel websites has been generally accepted by Croatian population as there is many offers from domestic renters on the websites of Booking.com and Airbnb.

Google maps and similar apps have made easier for tourists to see attractions in visiting countries.

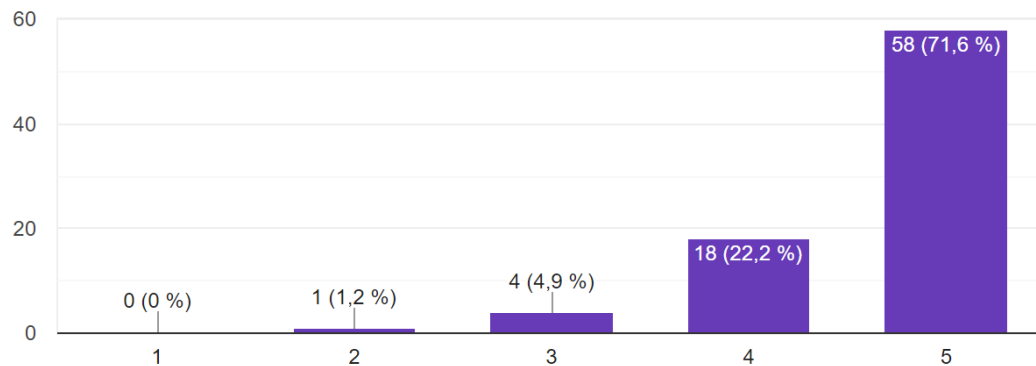


Figure 19- Navigational app in tourism

93.8 % of respondent agree with the statement that Google maps and similar apps have made easier for tourists to see attractions in visiting countries. 4.9 % were uncertain while 1.2 % disagreed with the statement. Navigational apps allow us to find any location and receive direction to particular location. It is a great tool in tourism industry as it allows visitors to navigate in the unknown area.

During summer season I am satisfied with the quality of internet connection.

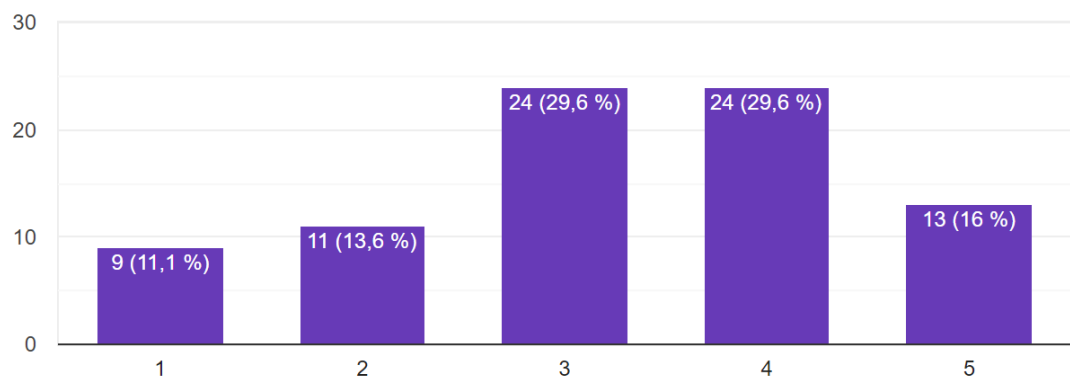


Figure 20- Quality of internet

45 % of respondents agree with the statement regarding satisfaction of the quality of internet connection, while 29.6 % were uncertain. 24.7 % disagreed with the statement, meaning that Croatia still have some issues regarding quality of internet. Internet is necessary in everyday life, especially during summer when tourist arrives.

Internet medium (Facebook, Youtube, Google) has a greater priority than mass medium (TV, Paper, Radio) in tourism promotion.

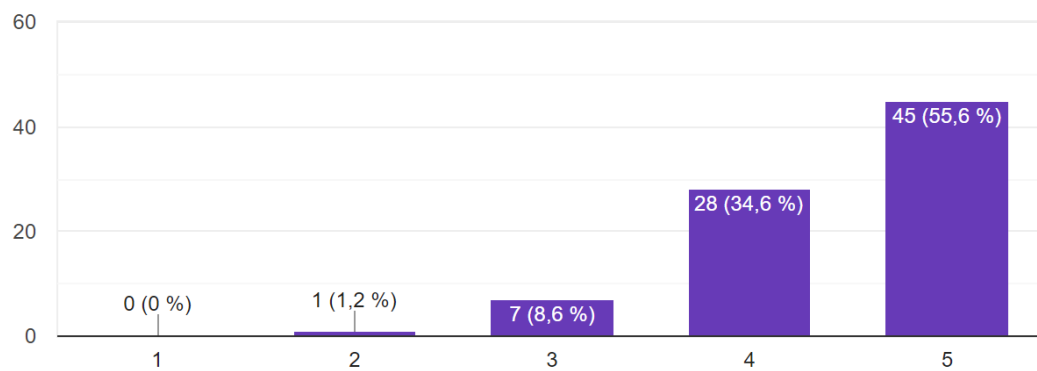


Figure 21- Internet medium vs traditional medium

90.2 % of respondents agree with the statement that internet medium (Facebook, Youtube, Google) has a greater priority than mass medium (TV, Paper, Radio) in tourism promotion. 8.6 % were uncertain and 1.2 % disagreed with the statement. Among younger generation, traditional media is slowly losing importance. Having option to connect to internet everywhere and any time gives internet medium huge advantage. But TV and radio offered their services over internet, making their presence known.

Mobile technology has enhanced sustainability in tourism by emphasizing green, clean and ethical high quality service.

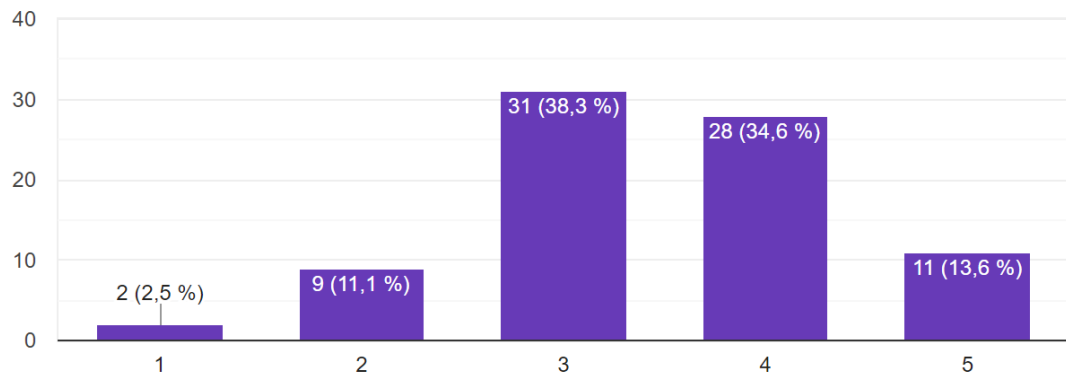


Figure 22- Sustainability

48 % of respondents agree with statement that mobile technology enhanced sustainability in tourism by emphasizing green, clean and ethical high quality service while 13.6 % disagreed with the statement. It is interesting to see that 38.3 % of respondents were uncertain, which could imply that term sustainability is not widely known to people in Croatia. Government should put more focus on educating and promoting sustainability and its benefits.

Electronic administration has eased complex bureaucracy in Croatia.

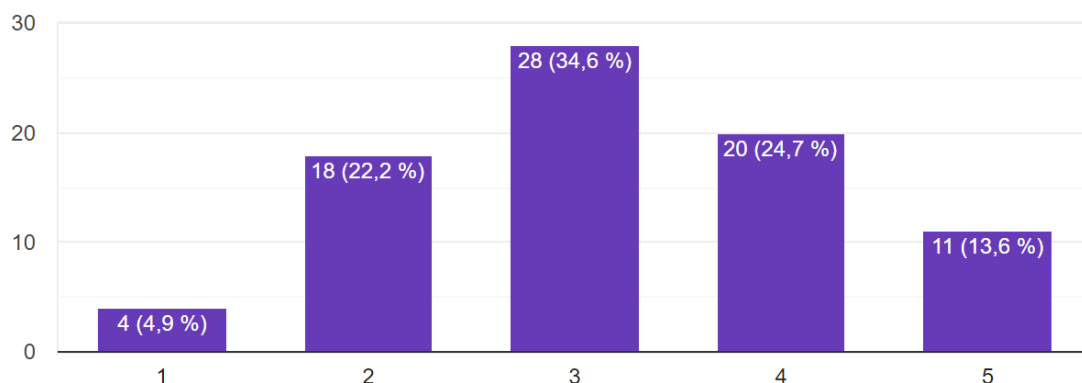


Figure 23- Electronic administration

38 % of respondents agree with following statement that electronic administration eased complex bureaucracy in Croatia, while 27.1 % disagreed and 34.6 % were uncertain. Opinions regarding this statement are quite divided. Some respondents agree, some disagree and a lot of them uncertain. This could mean that government tried to implement some changes to ease complex bureaucracy such as E-visitor site, but many still believes that those efforts are not enough.

Mobile banking app has simplified payment transactions in tourism sector.

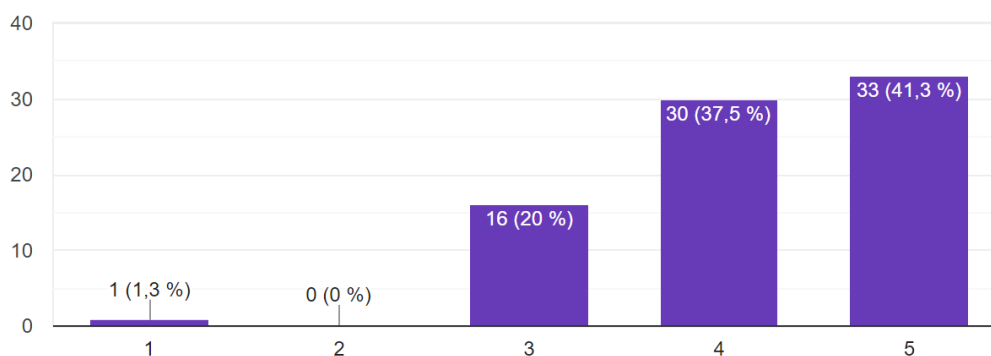


Figure 24 – Mobile payment

78.8 % respondents agree with the statement that mobile banking app has simplified payment transactions in tourism sector, while 20 % of them were uncertain and only 1.3 % disagreed with the statement. It is even more beneficial for tourists who do not have to exchange their money with unfavourable exchange rate. Banking app called Revolut recently became very popular among younger generation. This app is not backed by any bank institution, and when user withdraw money from any ATM, they are not charged with commission no matter in which country they are.

Internet has greatly contributed to development of tourism in Croatia.

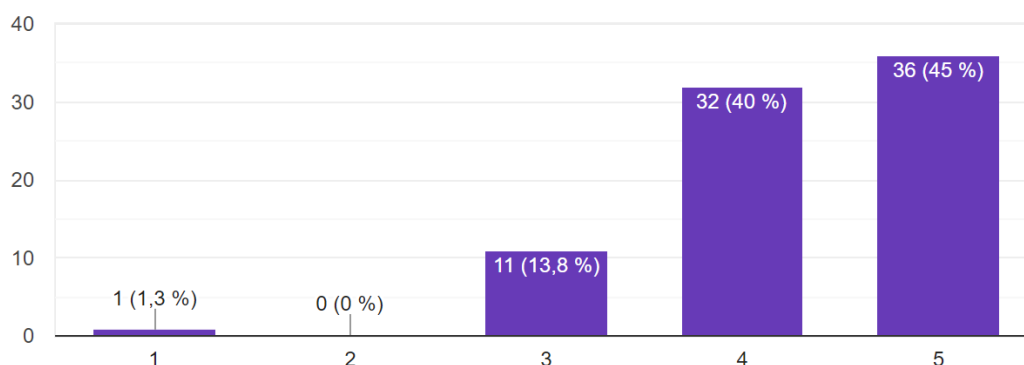


Figure 25 – Internet contribution to tourism development

85 % of respondents agree with the statement that internet has greatly contributed to development of tourism in Croatia, 13.8 % were uncertain and only 1.3 % disagreed with the statement. This results can be directly connected with Tomas research where 44.1 % of respondents claim that they use internet as a primary source of information.

Information and Communication technology enable us to address visitors needs easier than before.

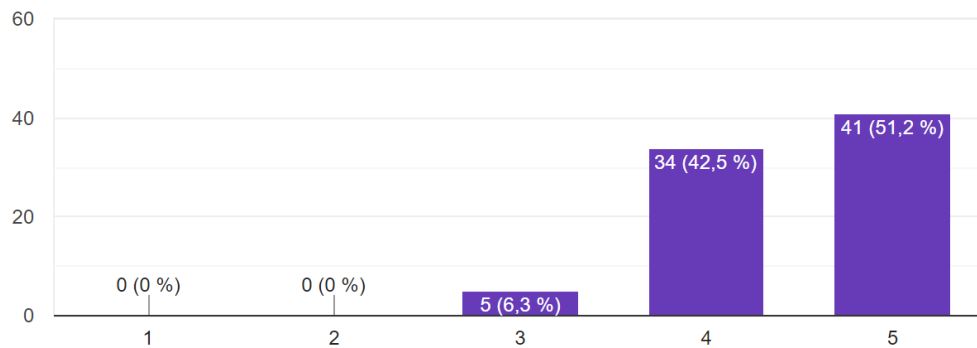


Figure 26 – Addressing customer needs

96 % of respondents agree with the statement that information and communication technology enable us to address visitor needs more easier than before and only 6.3 % were uncertain. We are now able to address visitor needs, meaning that quality of services provide should increase. Because of internet, tourists are now able to review and rate services and product publicly. As competition in tourism industry is intense, bad review could greatly affects businesses related to tourism.

Information and communication technology gave individuals more freedom in looking for information and planning holidays, and therefore it has made tourist agencies unnecessary

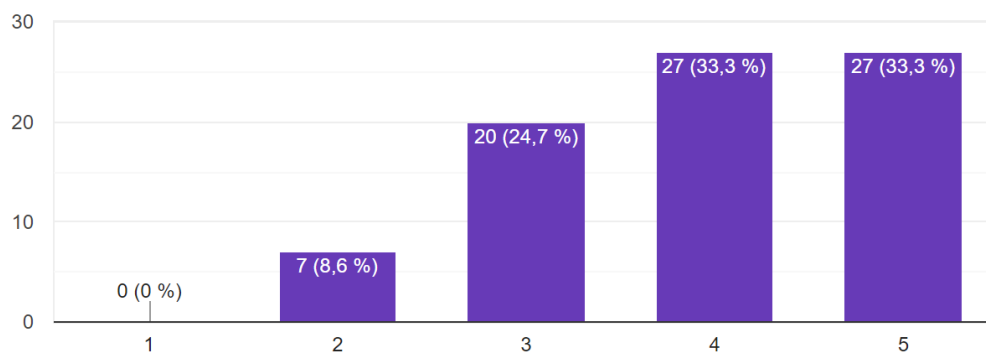


Figure 27 – ICT impact on tourist agencies

66.6 % of respondents agree with the statement that information and communication technology gave individuals more freedom in looking for information and planning holidays, and therefore it has made tourist agencies unnecessary, while 24,7 % of them were uncertain and 8.6 % disagreed with the statement. Traditional tourist agency have a problem keeping their presence on market as ICT enabled user to organise their own travels without paying any additional commission.

The most effective way to promote tourism in Croatia is through social media.

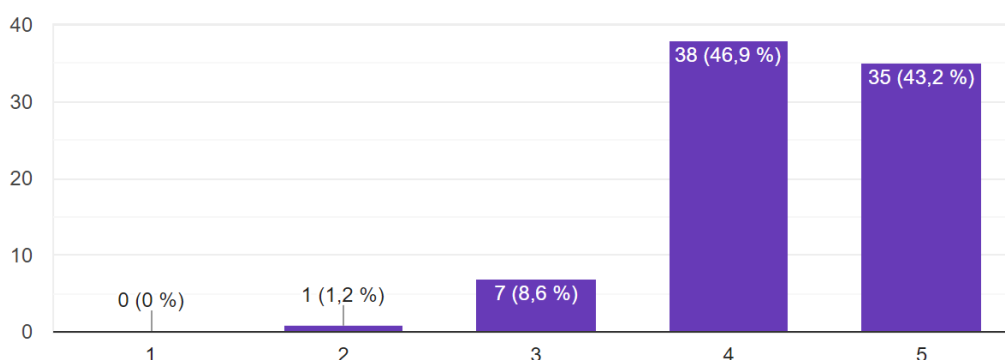


Figure 28 – Promotion through social media

90.1 % of respondents agree with the statement that the most effective way to promote tourism in Croatia is through social media, while 8.6 % were uncertain and only 1.2 % disagreed with the statement.

From the analyses, we can conclude that ICT have a major role in Croatian tourism industry and its expansion. Travelling is important in tourism so online reservation, especially for accommodation, have an important role. Majority of population in Croatia accepted and understands ICT benefits. It is up to business to use ICT on the best way possible to leave an impact on customers.

7. Suggested strategies

From analysis we can see that significant number of respondents were unsatisfied with quality of the internet connection. Big cities in Dalmatian coast do not have problem with internet connection, but countryside and especially inhabited island do have problem with internet connection. Problem is especially emphasized during summer, when great numbers of tourists arrives.

The problem is in overloading infrastructure as many devices attempts to connect on the same Wi-Fi router. Potential solution of this problem lies in network of cables which was installed under sea from 1974 to 1990 by JNA (Yugoslav National Army) as a part of secret project called “Neptun”. Purpose of this project was to establish missile system and centralization of communication system. Pipes with copper wire were place at Brijun all the way to the Prevlaka. Installation on Croatian territory is 700 km long in depth of 100 m. Its already existing infrastructure is ideal for connecting Adriatic islands with broadband internet.³⁰

The potential of navigation apps is not fully utilized to its potential. Main city of Croatia, Zagreb for over many years organizes Zagreb’s Advent market. “Zagreb be there” and “VoiceGuide” are apps that can show every corner of city and inform you about every attraction you stumble upon. Rest of the Croatia lacks in the quality navigation apps, even though they hold large potential as tourists could explore more of Croatia.

As promoting over social media is most efficient, Croatia should have more presence on social media, especially on Instagram, Facebook and Youtube. From analysis of questionnaire, people spent on average 4-5 hours on smartphone, meaning that the most efficient way to promote services is through social media. It is also important to interact on an interesting way with audience to occupy their attention. Croatia has amazing coast and nature, and it should be more promoted on social media. Internet has greatly contributed to tourism in Croatia but it still did not used its full potential.

³⁰ <https://www.jutarnji.hr/vijesti/hrvatska/uz-pomoc-titove-tajne-kabelske-mreze-neptun-vlada-pokrece-veliki-internetski-biznis/1185677/> (Sep 12,2019)

Mobile banking app simplified payment transactions in Croatia. Visitors fully appreciate this option of payment as they do not have to exchange currency with unfavourable exchange rates. But there is still a issue as not all service providers and traders possess equipment needed. They prefer to rely on traditional means of payment such as cash.

To emphasize green, clean and ethical services it is important to educate population and promote benefits of such services as they contribute to the sustainability. During summer season problems such as overcrowding and traffic congestion are not rare. The movement of tourism should be controlled to some extent to avoid such problems.

Croatia have major problem with complicated and inefficient bureaucracy. Government should be more focused on this issue, especially since ICT enables us to tackle this problem more efficiently. Many resources had been spent on inefficient administration, instead those resources should be invested in implementing digitalization in public administration. Every problem could be solved with few clicks, instead of personally coming to administration offices and waiting for a long period of time to solve the problem. Deeper analysis is necessary on impact of ICT on tourist bureaus in business networks and their impact on development of tourism in general.

Augmented reality and VR are still relatively new technology. It allows us to experiences touristic destinations without ever setting foot there. Such potential marketing tool should be more exploited, especially within tourist agencies, as it is hard to gain competitive advantage on global market.

In analysis we can observe that 84.1 % of respondents prefer smartphone device when accessing internet. Smartphone performs on the same level as computer or laptop even though it is the size of our hand. But because of fast performances, smartphone battery capacity is overloaded which requires frequently charging. Restaurants and bars should see this fact as an opportunity to increase the number of their customers. By offering free charging services with charging stand and free internet, they are able to attract large number of customers.

8. Conclusion

This paper objective was to evaluate role of ICT in tourism industry, determine the level of usage of ICT in tourism industry and to suggest measures in order to improve management. ICT have important role in Croatian tourism industry as both businesses and customers relies on. Ease of accessing information and simplified communication has an important role in Croatian tourism industry. Usage of ICT in Croatia steadily increases, but unfortunately, Croatia is below EU average and ranks 20th out of the 28 EU Members. In previous section, suggested strategies were proposed to improve quality of ICT in tourism management.

On internet, tourists are able to find all necessary information at one point, giving tourist more knowledge and making him more demanding. In order to meet demands, business needs to increase quality of their services, giving benefits to both sides and environment.

ICT and internet brought revolution to tourism industry. Tourism development is based on innovation and collaboration with customers. Based on modern technologies, new scientific tools are being design in order to boost tourism development.

It is important to raise awareness about sustainability, as future of tourism industry will greatly depend on it. Protection of environment is important and visitors expects for destination to have clean sea and fresh air. Pollution is a great threat to Croatia, since our destination was promoted to be pearl of Adriatic sea. Marine pollution from large cruise ships wastewater represents a serious challenge for Croatia. Large quantities of wastewater on cruise ship are generated and quality of wastewater poured in the sea and waste management on board are very important. Cruise ships also bring large amount of tourists into Croatian cities making them overcrowded. It is necessary to limit number of cruise ships entering port and tackle the problem of wastewater pollution.

Tourism industry in Croatia is biggest employer and that is why sustainable development should hold great importance in future of tourism industry. Mobile technology is able to deal with challenges by continuous assessment of tourism impact, monitoring and studying interaction, observing interaction between tourists and environment, planning tourism development, analysing tourists needs and expectation.

Croatian government issued Development Strategy of the Croatian tourism. 1st strategy was planned for period 1993 – 20013 and its basic goals were valorisation, reconstruction and protection of tourism resources. 2nd strategy was planned for period 2003 – 2010 which emphasized space as the most valuable tourism resource, supporting sustainable development and preservation of cultural heritage.

As population is aging, senior population will establish as important group in tourism demand on global market. Such trend should be closely observed, so tourist related business can anticipate changes and adapt their services.

From TOMAS research, we concluded that tourist in middle age are most dominant generation that travels to Croatia. Increase in generation Y implies that younger generations see Croatia as ideal destination for their vacations. Younger generation can serve as an ideal channel to promote Croatia as tourist destination through social media.

According to Digital Economy and Society Index (DESI), Croatia ranks 20th out of 28 EU member states. Although it is steadily increasing every year, Croatia is still below EU average.

Croatia has 700 km long pipe installation under sea since which is not in use. This presents great opportunity for connecting island with broadband internet. In 2013, government showed promise in realizing this project, but unfortunately till today nothing changed.

Because of rapid development of ICT, modern tourism market is in process of major changes. We can expect that ICT will continue developing, creating new solutions that are constantly improving, developing and changing. ICT implementation increased revenue and reduced operating cost, positively impacting competitiveness of organizations who fully implemented ICT.

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List of Illustrations

Figure 1. & 2. Tourist age – Tomas 2017.....	19
Figure 3: Reasons for visiting Croatia – Tomas 2017.....	20
Figure 4: Sources of information – Tomas 2017.....	21
Figure 5: Internet as source of information – Tomas 2017.....	21
Figure 6&7 – DESI ranking.....	23
Figure 8 - Connectivity.....	24
Figure 9- Human capital.....	24
Figure 10- Use of internet service.....	25
Figure 11- Integration of digital technology.....	25
Figure 12- Digital public services.....	26
Figure 13- Respondent age.....	27
Figure 14- Device preferences to access internet.....	27
Figure 15- Most used social media.....	28
Figure 16- Time spent using smartphone	29
Figure 17- Preferred mean of payment.....	29
Figure 18 – Preference of travel websites.....	30
Figure 19 – Navigational app in tourism.....	31
Figure 20 – Quality of internet.....	31
Figure 21 – Internet medium vs traditional medium.....	32
Figure 22 – Sustainability.....	33

Figure 23 – Electronic administration.....	34
Figure 24 – Mobile payment.....	34
Figure 25 – Internet contribution to tourism development.....	35
Figure 26 – Addressing customer needs.....	36
Figure 27 – ICT impact on tourist agencies.....	36
Figure 28 – Promotion through social media.....	37

List of graphs

Graph 1. The World Bank, Individuals using the internet (% of population).....	6
Graph 2. Daily average spending – TOMAS 2017.....	16